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# The Quaternary Mammal Collections at the Somerset County Museum, Taunton

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Throughout the latter part of the nineteenth century, the fossil mammal collection belonging to the Somerset Archaeological and Natural History Society (SANHS) housed at Taunton Castle was one of the most famous in Britain. In its early years the society had the foresight to acquire, by public subscription, the geological collections of Rev David Williams (1792–1850), Rector of Bleadon and Kingston Seymour, and of William Beard (1772–1868), the two most notable collectors of material from the Pleistocene bone caves of western Mendip. The Williams and Beard Collections included material from the sites of Bleadon Cavern, Hutton Cavern, Banwell Bone Cave and Sandford Hill (Rutter 1829; Bidgood 1879). Through time, these collections were augmented by numerous other acquisitions, notably material from the early excavations at Hyaena Den at Wookey Hole (Dawkins 1862, 1863a) and an important series of specimens brought together by Arthur Bulleid from the Burtle Beds of the Somerset Levels (Bulleid and Jackson 1937).

As a collector, William Beard far outstripped the Rev Williams in both zeal and attention to detail. Beard is described as being a rather obsessive, self-important character and the subject of some considerable amusement to the many visitors who came to see him and his collection at his home at Bone Cottage, Banwell. He was a good collector by the standards of his day, clearly going to some pains to acquire, whenever possible, anatomically comprehensive material of the species represented and seems to have gone to some trouble in distinguishing between the faunas from different sites. By contrast, Williams was after "cabinet" specimens. He creamed-off some of the better material but kept no record of its locality – his specimens are distinguished solely by being marked with an abbreviation of his name ("Wms").

William Bidgood, curator of the Society's museum from 1862 to 1901, took great interest in the Quaternary teeth and bones, transforming them into a first class research collection which was widely used by specialists of the day. His skills as a curator were quite exceptional, and some of his beautiful lithographs of SANHS specimens were used in the early parts of the Palaeontographical Society Monographs on the *British Pleistocene Mammalia*, a series of works by various authors containing many descriptions and illustrations of specimens from Taunton Museum (eg Dawkins and Sanford 1868). Both William Boyd Dawkins and W Ashford Sanford were heavily involved in work on the Mendip cave material, and it is largely through their efforts that the collection became more widely known in scientific circles.

After Bidgood's death the Quaternary mammal collections at Taunton underwent a prolonged period of benign neglect. Significant parts of the original collection remained on display in the Great Hall at Taunton Castle but the rest of the material was shuffled around from place to place as the dominant focus of the Society's activities and interests changed from natural history to the county's rich

archaeological record. Although storage conditions were probably not ideal, the collection seems to have survived in reasonable order up until the early 1970s at which time someone is believed to have ordered its disposal. The survival of the material is attributed to the action of AD Hallam who hid many of the bones in a coal shed behind the old curator's house at Taunton Castle. Naturally enough, details of what went on in this period are obscure and undocumented, but this was definitely the low point in the history of this remarkable collection.

In the early 1990s Dennis Parsons, Curator of Natural History for the Somerset County Museums Service (SCMS), contacted the author asking for advice. The Quaternary mammal collection had by then been rediscovered, boxed and put into store but it was still in a very sorry state. Material from each of the sites had been mixed together, many specimens were broken and everything was covered in grime. An initial examination showed that the collection was potentially salvageable but that a major undertaking would be required to get it back into usable condition. Over the next few years the author, Dr Roger Jacobi and Dr Danielle Schreve spent hundreds of hours cleaning, repairing, sorting, identifying and cataloguing the teeth and bones, and eventually arranging the collection in new storage units acquired for the purpose by the SCMS. Dennis Parsons put in a huge amount of work supporting our visits, raising funds and personally moving the collections back and forth between the workroom at Taunton Castle and the Bindon Road Stores. Adrian Doyle from the Natural History Museum (NHM) conducted a conservation survey of the collection and on the basis of his report the SCMS employed Simon Jones to carry out an extensive programme of controlled cleaning and conservation. This work has gone exceptionally well and the collection is now in very good physical condition. Our manuscript catalogue of the collection, comprising over 10,000 specimens, is currently being entered into the museum's computer catalogue by Mark Davis.

Supporting our efforts on the collection itself, Sue Goodman was commissioned to compile a bibliography of things relating to the collection and to search for archival information relating to Beard, Williams and other people closely associated with work on the faunal remains. Her work has proved immensely useful to the project.

The major sites represented in the collection are documented in the chronological order of their contained faunas. All of the material has been completely re-identified as if it was newly collected so there is no reference to or reliance on previous accounts. This is the first reappraisal of the contents of the SANHS Quaternary mammal collection for over a century and a good opportunity to convey to the Society an outline of the results of this project.

## Quaternary Subdivisions

In recent years there have been big changes in our understanding of Quaternary climatic events and a corresponding change in the terminology currently in use to describe the subdivision of the more recent part of the geological record. Throughout this account the new subdivision of the Quaternary Period based on Oxygen Isotope Stages (OIS) will be used. Oxygen Isotope Stages are based on long marine sequences recovered from sediments on the deep ocean floor which record major changes in global ice volume through the varying ratio of oxygen isotopes in the skeletons of fossil foraminifera. At times of high global ice volume the ratio of $^{18}O$ to $^{16}O$ in seawater rises because land ice is isotopically light. This leads to $^{18}O$ enrichment in the oceans during cold phases. The periods of low relative $^{18}O$ values are given odd numbers, OIS 1 being the present warm stage, OIS 3 being a relatively warm but very unstable period in the middle of the Devensian cold stage, OIS 5 representing the Ipswichian or Last Interglacial and OIS 7 the penultimate interglacial. The intervening even numbered stages represent periods of high global ice volume, OIS 2 representing the Late Devensian or Last Glacial Maximum, OIS 4 the Early Devensian and OIS 6 an intensely cold period prior to the Last Interglacial.

## Bleadon Cavern

Bleadon Cavern (ST 36065813) is one of a number of caves and fissures reported from beneath Hutton Hill in western Mendip. The site was collected from by Beard and to a lesser extent by Williams from 1833 to 1834. This cave, the location of which was lost for many years, was rediscovered in 1970 and Irwin and Richards (1997) have recently confirmed

its identity through archival sources. Surviving fragments of cave matrix show that bones and teeth were very abundant, mostly broken and were densely packed in a confused mass. This kind of assemblage, usually associated with debris flows, suggests secondary movement of the bone-bearing deposits within the cave, possibly under periglacial conditions. In spite of this the assemblage looks very coherent and there is no obvious evidence of mixture of material of more than one age.

The collection is particularly notable for its lion, horse, wild boar, red deer, roe deer and bovine remains. It is believed to represent the accumulation of debris within a lion den in which cubs were raised. The abundance of horse and of wild boar (an otherwise rare animal in the British Pleistocene record) is probably accounted for by the known prey selection preferences of modern lions. Comparison with mammalian faunas from open sites strongly supports correlation of this assemblage with one of the warmer parts of OIS 7 (Schreve 1997).

| | |
|---|---|
| *Lepus timidus* | mountain hare |
| *Citellus* cf. *citellus* | ground squirrel |
| *Microtus oeconomus* | northern vole |
| *Canis lupus* | wolf |
| *Vulpes vulpes* | red fox |
| *Ursus arctos* | brown bear |
| *Mustela putorius* | polecat |
| *Crocuta crocuta* | spotted hyaena |
| *Felis sylvestris* | wild cat |
| *Panthera leo* | lion |
| *Panthera pardus* | leopard |
| *Palaeoloxodon antiquus* | straight-tusked elephant |
| *Mammuthus primigenius* | mammoth |
| *Equus ferus* | horse |
| Rhinocerotidae sp. indet. | rhinoceros |
| *Sus scrofa* | wild boar |
| *Cervus elaphus* | red deer |
| *Capreolus capreolus* | roe deer |
| *Bos primigenius* | aurochs |
| *Bison* cf. *priscus* | bison |

Table 7.1: *The mammal fauna of Bleadon Cavern as represented in the SCMS collections*

## Hutton Cavern

Hutton Cavern is believed to have been quite close to Bleadon Cavern, but the site has not yet been relocated. It was discovered in about 1756 by ochre miners (Catcott 1768; Buckland 1823) but subsequently lost. After a deliberate search the site was successfully relocated in 1828 and Beard and Williams were able to collect quite a large quantity of well preserved material. The cave was filled with soft ochreous earth and appears to have been very prone to collapse. We do not know a great deal about the distribution of bone other than the fact that it was abundant, but surviving material shows that many of the animals probably came in as complete carcasses.

This collection is notable for its wolf and horse material and for the occurrence of a small number of teeth representing a distinctive form of the mammoth – often referred to as the "Ilford-type mammoth" after the locality in the Thames Valley where its fossils are common. Unusually, there are no bovine remains recorded from Hutton Cavern. The abundance of wolves may suggest that this site was a wolf den but there is little taphonomic evidence in the form of gnawing marks or breakage patterns to back up this assumption. The mammals fit in well with a late OIS 7 age, rather younger than the Bleadon fauna but still within the same major climatic episode.

| | |
|---|---|
| *Lepus* sp. | a hare |
| *Allocricetus bursae* | dwarf hamster |
| *Dicrostonyx torquatus* | collared lemming |
| *Vulpes vulpes* | red fox |
| *Canis lupus* | wolf |
| *Crocuta crocuta* | spotted hyaena |
| *Felis sylvestris* | wild cat |
| *Panthera leo* | lion |
| *Mammuthus primigenius* | mammoth |
| *Equus ferus* | horse |
| *Sus scrofa* | wild boar |
| *Cervus elaphus* | red deer |

Table 7.2: *The mammal fauna of Hutton Cavern as represented in the SCMS collections*

## Burtle Beds

The Burtle Beds of the Somerset Levels represent a period of fluviatile and shallow marine sedimentation at a time of high sea level. Now formally recognised as the Burtle Formation (Hughes 1980), vertebrate fossils appear to have been concentrated in the basal unit of the Middlezoy Member in sediments which are thought to be a palaeosol which has been locally reworked by marine action. The Burtle Beds have been identified at various sites on the Somerset Levels to the north and south of the Polden Hills, but their main development is along

a stretch to the south of King's Sedgemoor Drain running from Chedzoy, through Westonzoyland and Middlezoy to Othery. The most famous fossiliferous sites were the former pits at Greylake and much of the mammalian material from these workings was described in the Society's *Proceedings* by Bulleid and Jackson (1937). The age of the Burtle Beds has been debated for some time. Hunt (1998) gives a good summary of the views of previous workers and an excellent description of the classic section in the Greylake no 2 Quarry (ST 385336). The fauna clearly represents temperate conditions. Hippopotamus and fallow deer are major elements of the British mammal fauna of the earlier part of OIS 5. The absence of horse is also suggestive of a Last Interglacial age, the specimens reported in Bulleid and Jackson (*op cit*) being very much later in date than the rest of the fauna.

| | |
|---|---|
| *Canis lupus* | wolf |
| *Crocuta crocuta* | spotted hyaena |
| Elephantidae sp. indet. | an elephant |
| *Stephanorhinus hemitoechus* | narrow-nosed rhinoceros |
| *Hippopotamus amphibius* | hippopotamus |
| *Dama dama* | fallow deer |
| *Cervus elaphus* | red deer |
| cf. *Capreolus capreolus* | roe deer |
| *Bos primigenius* | aurochs |
| Bovini sp. indet. | a bovine |

Table 7.3: *The mammal fauna of the Burtle Beds as represented in the SCMS collections*

## Banwell Bone Cave

Banwell Bone Cave (ST 38225881) is situated at the west end of Banwell Hill in western Mendip. The site was discovered in 1824 during attempts to find better access to the Banwell Stalactite Cave and was explored and excavated thereafter by William Beard. The upper part of the cave contained a homogeneous bone-bearing deposit in which complete individual skeletal elements where often extremely well preserved but there was little evidence of direct association between the bones. The lower parts of the fossiliferous cave deposit are still in place and can be seen to contain abundant bone. The material appears to have been introduced gradually, with bones, stones and mud coming in at a steady rate over quite a protracted period of time. This deposit has none of the characteristics of a classic debris flow, nor those of a talus cone, yet the bones have many surface features suggesting that they accumulated outside the cave and were transported inside by some secondary process, perhaps by intermittent flooding. Beard stacked the commoner bones around the walls of the cave to form decorative blocks, some of which still survive. He was encouraged by the Bishop of Bath and Wells to develop the site as an attraction for visitors, and it became the centrepiece of an early theme park devoted to the exposition of the Biblical Deluge. Public interest in the site declined after Beard's death in 1868, but the site has always remained accessible. The cave has recently been cleared of later excavation debris as part of a programme of work instigated by English Nature and the SCMS in collaboration with the owners.

The Banwell Bone Cave fauna is dominated by remains of bison and reindeer, bison being by far the dominant species represented. One of the most spectacular features of this collection are the remains of a huge form of brown bear which closely matches the living polar bear in many features. This appears to have been the dominant predator in this restricted, cold stage assemblage. The wolves all have very heavily worn teeth, suggesting that they were primarily bone-eating scavengers. Currant and Jacobi (1997) have outlined the reasons for assigning this distinctive faunal grouping to OIS 4, corresponding to the Early Devensian. It is proposed to make this site the type locality for the Banwell Bone Cave mammal assemblage-zone, a formal biostratigraphic unit, and the SCMS collection is critical to the interpretation of this concept (Currant and Jacobi in press).

| | |
|---|---|
| *Lepus timidus* | mountain hare |
| *Vulpes lagopus* | arctic fox |
| *Vulpes vulpes* | red fox |
| *Canis lupus* | wolf |
| *Ursus arctos* | brown bear |
| *Lutra* sp. | an otter |
| *Gulo gulo* | wolverine or glutton |
| *Rangifer tarandus* | reindeer |
| *Bison priscus* | bison |

Table 7.4: *The mammal fauna of Banwell Bone Cave as represented in the SCMS collections*

## The Hyaena Den, Wookey Hole

The Hyaena Den is situated at the base of the cliffs in the eastern wall of the Wookey Hole ravine (ST 53234794) near the rising of the River Axe. The original cave entrance was uncovered and destroyed in the cutting of the leat which serves the paper mill in 1857. This work took out an important part of what must have been one of the richest Middle Palaeolithic human habitation sites in Britain. The palaeolithic archaeology was included within a stratified series of cave earths which produced abundant bone and further stone tools during the subsequent excavations by Boyd Dawkins and others (Dawkins 1863a). For a protracted period the cave had been used as a den by spotted hyaenas who had accumulated large numbers of heavily gnawed remains of their prey, most notably those of the woolly rhinoceros. Like many British hyaena dens this site proved to represent OIS 3, the Middle Devensian, when the British mammal fauna was dominated by mammoth, woolly rhinoceros and horse. Many of the finds from the Hyaena Den were taken off to Wells to be ground up for fertilizer, so this collection is a rather precious remnant.

Recent excavations by Roger Jacobi proved the presence of waterlain deposits containing elements of a sparse fauna similar to that from Banwell Bone Cave underneath the hyaena occupation horizons, further confirming the relationship between these two distinct mammalian assemblages. The cave has also yielded later faunal remains but these are not represented in the SCMS material.

| | |
|---|---|
| *Ursus arctos* | brown bear |
| *Crocuta crocuta* | spotted hyaena |
| *Panthera leo* | lion |
| *Vulpes lagopus* | arctic fox |
| *Equus ferus* | horse |
| *Coelodonta antiquitatis* | woolly rhinoceros |
| *Mammuthus primigenius* | mammoth |
| *Megaloceros giganteus* | giant deer |
| *Cervus elaphus* | red deer |
| *Rangifer tarandus* | reindeer |
| Bovini cf. *Bison priscus* | bison |

Table 7.5: *The mammal fauna of the Hyaena Den, Wookey Hole as represented in the SCMS collections*

## Sandford Hill

Curiously little is know about the circumstances of discovery of the largest of the SCMS fossil mammal collections. The site on Sandford Hill seems to have become accessible in 1838 and been mainly collected from by Beard, although a few choice specimens were acquired by Williams. There appears to be no contemporary published or manuscript description of the Sandford Hill cave or caves collected from by Beard. Chris Richards (pers comm) has found a late eighteenth-century description of the finding of "elephant" remains on Sandford Hill which were stated to come from a cave on the northern side of the summit of the hill. This description corresponds rather well with the group of deep fissures known variously as Sandford Rifts (West) or Triple Hole (ST 42685905). These fissures are among the most likely sources of Beard's collection and certainly merit further investigation.

There are two fairly distinct groupings within this collection. The spotted hyaena remains and all of the material which bears signs of having been gnawed by spotted hyaenas is represented by quite heavy, dense bone. This is a highly selected collection dominated by cranial material of spotted hyaena – one of the finest collections of its type in Britain. By contrast the abundant reindeer remains are light in weight and have a very crisp preservation with no trace of carnivore modification, a very valuable collection containing virtually all skeletal elements. These same characteristics are also shared by remains of other species, notably lion and some of the woolly rhinoceros specimens.

It is a slightly odd assemblage and may possibly represent material collected from more than one horizon or locality. The group of specimens including spotted hyaena is a good Middle Devensian OIS 3 assemblage very similar to that from the Hyaena Den, but the reindeer remains and similarly preserved finds may represent a later stage. At some future date it would be useful to put together a radiocarbon dating programme to test the unity of the preservation-type groupings in the Sandford Hill collection.

| | |
|---|---|
| *Lepus timidus* | mountain hare |
| *Panthera leo* | lion |
| *Vulpes vulpes* | red fox |
| *Canis lupus* | wolf |
| *Crocuta crocuta* | spotted hyaena |
| *Ursus arctos* | brown bear |
| *Equus ferus* | horse |
| *Coelodonta antiquitatis* | woolly rhinoceros |
| *Rangifer tarandus* | reindeer |
| *Cervus elaphus* | red deer |
| *Bison priscus* | bison |

Table 7.6: *The mammal fauna of Sandford Hill Cave as represented in the SCMS collections*

## Some general observations about the collection

As with many nineteenth-century collections, there is a strong collector bias in favour of the larger, more complete and more readily identifiable material. There are hardly any unidentifiable fragments of larger mammals and small mammals are not particularly well represented at all. Of those which do survive, very few have retained their locality data. Nearly all of the rodent and other small mammal bones had been stuck to cards with fish glue and a large number of these specimens had become detached and lost. There also appears to have been a certain amount of overconfident secondary assignment of the smaller material to particular localities, much of which was not borne out by close examination of the specimens. This may have been done by Sanford while he was compiling notes for his work on the fossil rodents of the Somerset Caves (Sanford 1869). He has written on surviving labels comments like "probably from Hutton Cavern" and "from Hutton or Bleadon" which suggests that the small mammals were not adequately labelled by the collector. Considerable caution should be exercised over the provenance of all of the small material.

It was only possible to reconstruct this collection because Beard's larger mammal specimens were marked in ink with abbreviated locality data: Bl.B (=Bleadon, Beard); Hut (=Hutton); Ban (=Banwell) and S.H. (=Sandford Hill). The Burtle Beds material could be identified through surviving labels or from the descriptions of specimens given in Bulleid and Jackson (1937). Sanford's published catalogue of the Felidae (Sanford 1867) proved to be useful, but a number of the entries were inaccurate or misleading.

We found that the original locality data on some of the figured specimens was different to that which has been published. After careful examination of the preservation of the specimens and the site markings we are confident that in nearly all cases it is the published data which is incorrect. The corrected details of all of the published material will be made available at some later date.

Most of the collection had been soaked or brushed with size (a thin glue made from fish swim bladders) soon after it was collected. William Beard's account books record obtaining materials specifically for this purpose. Over time the glue attracted and retained dirt and in some cases cracked off, damaging specimen surfaces. Although the collection has now been carefully cleaned there will still be traces of size within nearly all of the bones and this should be borne in mind by anyone considering future destructive sampling for dating, isotopic or molecular analyses.

The above text deals with the major Somerset Pleistocene bone collections but it is by no means an exhaustive coverage of the contents of the SCMS Quaternary vertebrate holdings. A large collection of Holocene remains, including human and domestic and wild animal remains from "Cockles Wood Cave" merits further research. There is also an important and largely undisturbed fragment of the William Pengelly collection from Kent's Cavern, Devon, still bearing its original excavation labels. Many other sites are represented by small numbers of finds.

Once the current phase of work is completed this magnificent collection will be available for research, exhibition and educational purposes. Quite a large number of people have contributed to this project in various ways over the last seven years and my thanks go to all of them. I must pay particular tribute to Dennis Parsons for his logistic support, physical effort and encouragement throughout, to Simon Jones for the superb work he has done in cleaning and conserving the specimens and to my two main collaborators, Danielle Schreve and Roger Jacobi, for helping to turn a difficult task into a thoroughly enjoyable and rewarding experience.